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clay, (3) in basketry, (4) in copper. The designs and plans will be original, so far as possible, and cannot yet be given.

History: Copper will be used by the children for the first time in the construction of trays, picture frames, etc. On these articles they will hammer simple designs. Before using the material they will examine the collections of metal work in the Field Columbian Museum, the Art Institute, and elsewhere, in order to form some idea of the character of designs in this new material. They will draw their designs and model them either in clay or wax to see how they will appear when raised on copper. Then each will execute his design in copper.

In connection with this work, stories will be told of the discovery of copper and the use of copper to early peoples. Copper compared with other metals.

Geography: The location of our large mines. How and in what form the metals are discovered; the different ways of mining; the life of a miner.

It is impossible for the children to understand mining without a knowledge of the cutting power of rivers.

Science: (1) Examination of the different ores—copper, lead, silver, iron, and gold, (2) Experiment to get the metal out of the ore. Visit to foundries and smelters. (3) Examination and identification of the rocks in which the ores are found. (4) Examination of crystals under a microscope; study of crystallization.

History: The story of La Salle and Fort Dearborn will be completed. The fort will be built on a large sand table in order to image better the country at that time.

Science: Study of the landscape continued. Continuation of the study of the relation of temperature, wind, and moisture to the changing landscape.

Literature: Stories of Christmas in other lands. Continuation of *The Story of Siegfried*.

Dramatic reading: Dramatization of scenes from *The Story of Siegfried*

Reading of "The Ruggles Christmas Dinner," in *The Birds' Christmas Carol*, by Kate Douglas Wiggin.

Home economics: Making of candies for Christmas.

Music: Christmas songs. (See fifth grade.)

French: The French is directly correlated with all the other work of the grade. (See third grade.)

FIFTH GRADE.

HARRIET T. B. ATWOOD.

REVIEW FOR OCTOBER.

History, industrial art, manual training.—During October the children were engaged in making hand-looms in the shop, designing a table

cover for the schoolroom, designing individual plates for the daily luncheon, and modeling the plates in clay.

The designs for lunch plates drawn by each child were found to be crude and unsymmetrical. The children saw the need of learning to make perfect circles, and of dividing circles into equal segments. The mathematics hour was used for this work. A few beautiful designs were shown to the class, and a trip was taken to Burley's and to the Chinese china stores. New designs were then drawn and colored, and the work of making the dishes was begun.

The work involved in planning the loom was described in the November number of the COURSE OF STUDY.

The choice of the table cover, as the first article to be woven, was made after class discussion. The articles to be made later are curtains for bookshelves and windows, curtain cords, a school banner, and bags for carrying books. The children decided, after enumerating the various fabrics now in use, and examining woven articles in their homes, that wool would be the easiest material to work with. The woof of the table cover is, therefore, to be coarse wool filling, and the warp, cotton carpet cord. Before designing the table cover the children studied the designs found in their homes, and in books and pictures of the library. *William Morris; His Art, His Writing, and Public Life*, by Aymer Vallance, was found especially helpful. It was decided to make twelve-part designs, so that each member of the class could weave a part. Such a design is being made, and the final design is to be decided by class vote. The designs are drawn and then colored with water colors.

While discussing the ways of weaving and the materials used, each child was asked to find out all he could at home about the weaving which used to be done in the homes of America. Most of the children gave accounts of the weaving done in their great-great-grandmothers' days, and some possessed old New England spinning wheels and looms. A study of the home life in colonial New England is now being made. For oral reading the children are studying Longfellow's *Courtship of Miles Standish*.

Home economics.—After the experiments on the drying of fruits recorded in the November COURSE OF STUDY, the children prepared a half peck of apples and hung them on strings to dry for Thanksgiving. For the same festival they prepared three quarts of unfermented grape juice. They have prepared a small amount of apple-cider vinegar for making candy for Christmas. In addition to this they prepared a dessert for one of their luncheons. First the different ways of cooking apples were briefly discussed. Each child was then allowed to cook an apple for his luncheon in the way he liked best. The results were compared, and still other ways of cooking apples were considered.

The recipes used were discussed by the children after each cooking lesson, and were then written down for future reference.

Nature study.—The three phases of nature study outlined in the October number were carried out as follows: (1) The autumnal condition of the trees, shrubs, and herbs was noted and recorded in writing and paintings. Seeds distributed by wind, animals, water, and plant mechanisms were collected and preserved; autumn leaves were pressed to send to children in tropical countries; duckweed and various algæ were collected on field trips and placed in the aquaria. At their *own suggestion* several children prepared at home some experiments for the schoolroom, viz., they placed a sweet potato in a jar of water; planted birdseed in a sponge; started seeds in a netting placed over water. (2) Animals were brought from each field trip and provided with suitable homes in the schoolroom. The aquaria and animal cages are at present stocked with caterpillars, cocoons, mosquito larvæ, snails, leeches, fish, water scorpions, four snakes, and a newt. The newt has buried himself in the earth. The children employed several library periods in looking up the various animals and finding out how to care for them. They are keeping written records of the condition of their animals. (3) Two visits to the new school site were made, and its autumnal condition was recorded in color. The trees on the area were examined, and a list of the kinds found was made for future use. (4) Committees appointed for the purpose made daily records of temperature, frost, dew, and rainfall. Following the field trips to Lakeside, the swamp, and Beverly Hills, the autumn landscapes seen were painted.

Geography.—Field trips were taken to Lakeside, the swamp at Seventy-ninth street and Wentworth avenue, Beverly Hills, a farm near Summit, to permanent site of the school (twice).

At Lakeside the children studied the bluff, beach, and ravines. They took note of the materials of each topographic form, and brought back specimens of rounded stones, gravel, sand, clay, and vegetable mold. Rough pencil sketches were made in the field and paintings on the return. The children wrote descriptions of each region visited. The discussion that followed the field trip to Lakeside brought out the following points: The children had seen miniature cliffs which had been recently cut in the sand of the beach, sand bars, deposition of material on north sides of piers, wind ripple marks in the sand, wave ripple marks, wash from clay bluff caked over sand of beach, small gullies in clay bluff, increase in width and depth of ravine from source to mouth, side cutting along the stream. They had learned to recognize granite, slate, limestone, and the different soils seen on the trip. They had noted the color of the lake; the beauty of the autumn landscape; the scarcity of birds at this season; the unstable condition of the bluff face, and consequent lack of vegetation; the difference in appearance of a ship on the horizon, seen from the beach and from the crest of the bluff. These data are being used constantly to aid in building up the images of other regions which are being studied, and are found to be invaluable to all the other work.

On the farm trip, the grade and a corps of pedagogic students were divided into committees to investigate and report on special topics. The topics chosen were: (1) buildings of farm; (2) animals of farm, their care and food; (3) produce of farm; (4) farm tools and implements; (5) farm work going on in October. On their return the committees reported to the class as a whole, and these reports are being written up by the children.

Each locality visited was located on a relief map of the Chicago region. The story of the Chicago region, *i. e.*, its geological history, is being gradually worked out by the class.

A chalk-modeled map of North America, and also a physical map with political divisions, have been placed in the room. The first work upon the continent has consisted of reports given by the children of the regions of North America with which they are personally acquainted. These areas are located on the chalk-modeled map, reference being made to the political map whenever necessary. The reports are still in progress.

Writing, spelling, English.—(See also fifth and sixth grades in the November issue.) Papers on the following subjects were written by the children: "The North Shore;" "Beverly Hills;" "The Swamp;" "Animal Life of Schoolroom;" "Aquaria;" "The Farm;" "Recipes for Grape Juice, Dried Apples, and Apple Sauce;" "Story of the Wood Cutter and the Hobgoblins;" "Trees of School Site."

Music.—Songs sung in October were: "We Plow the Fields," "Harvest Songs," "Song of the Mill," "Sea Horses," "My Heart's in the Highlands," "Sur le Pont d'Avignon," and the "Marseillaise."

Literature, oral reading, dramatic art.—The children read orally "Old Pipes and the Dryad;" each child read to the class a favorite story, and we have begun to read *The Courtship of Miles Standish*. The story of the "Woodcutter and the Hobgoblins" was told to the grade, and the children planned to dramatize it for Halloween. Its dramatization was written out by each child, but owing to lack of time the plan was not carried out. Instead, colored illustrations were made, and one child told the story in morning exercises.

Mathematics.—The way in which mathematics is pursued was fully discussed in last month's issue. The actual problems used in October were as follows: finding of average age of class in years and months; finding amount and cost of materials for loom; making of plan to scale of one-half actual size; calculating number of tulips needed for the grade garden, garden 2×9 feet, tulips 6 inches apart, margin of 3 inches left on edge of garden; making of plan of garden to scale of 1 inch to 1 foot; finding loss of weight in drying apples in oven and in sun; dividing circles into $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{6}{7}$; calculating cost of tulip bulbs; calculating cost of three quarts grape juice made by class. Processes used were addition, subtraction, and division of decimals; addition, subtraction, multiplication, division, and partition of whole numbers; reducing fractions to lowest terms; finding least common

denominator; factoring; changing years to months and months to years, etc. Drill was given in simple operations, as $\frac{1}{2}$ of 20, 12×4 , $15 \div 3$, $7 + 8$, $12 - 5$, and children have been asked to learn tables at home. Additional examples in long division, division of decimals, and factoring were assigned to children who found difficulty with the work.

French.—It has been decided to have all the grades take turn in serving luncheon to each other. The luncheon is to be prepared and served in French, and French only, so far as possible, spoken during the meal. Entertainment of some kind was suggested, and a game of cards devised in which the different articles used on the table were grouped in sets of four, making a book. The game is to be played in the same way as the old game of authors; for example, knife, fork, soup spoon, and teaspoon constitute a book, each card bearing the drawing of one article and its name in French.

The "Marseillaise" has been learned and sung by the whole school as a typical French patriotic song, and the third, fourth, and fifth grades have learned, played, and illustrated with paints the little French round, "Sur le Pont d'Avignon." All new words presented were written upon the blackboard, and the children were frequently called upon to express themselves by means of writing. As a result of this, when the fifth-grade children were asked to write upon the blackboard their favorite verse of the French round in French, many of them wrote the entire verse without help, and in two cases a single correction was all that was found necessary.

REVIEW FOR OCTOBER.

(FRANCIS W. PARKER SCHOOL.)

WILLARD STREETER BASS.

History.—The work began with a description of the Buffalo exposition by those pupils who had visited it. The names of the countries which had exhibits there were given, and their location was roughly determined. The fact that many of the descriptions of these exhibits were written in Spanish was noticed. The architecture of the exposition was studied, and its appearance compared with that of the cathedral at Mexico City. The similarity was at once apparent to the children, but they were not certain just why that style was called the Spanish-American, and why Spanish is spoken in some parts of America and English in others. To find how this came about we studied the discovery and colonization of America.

We first compared the condition of America and Europe at the close of the fifteenth century. The condition of the various Indian tribes in respect to manner of living, industries, etc., was studied and represented by blackboard drawings of characteristic buildings, occupations, etc. Among the drawings were the long house of the Iroquois, the round house of the Illinois, the cliff dwellings of the Pueblos; making of canoes, cooking, etc

European civilization, books, printing, commerce, etc., were also described. The prevailing opinions concerning the shape of the earth, the commercial relations with the far East, and the desire for a short trade route thither were points next noted, and then the story of Columbus and his voyage followed.

The new material was presented to the class by picture and story, but mainly by reading from Guerber's *Story of the Thirteen Colonies*, a paragraph being read by one member of the class, and the reading followed by a discussion by the whole class with books closed.

Geography.—The work in geography followed closely the work in history. The general form of the land masses of the western hemisphere was familiar to the class from the well-known exposition poster. The location of the various countries represented at the exposition was determined, and the study was directed to the form of the earth and the reasons for believing it round. The appearance of vessels on the lake was conclusive proof to the class that the surface of the lake was curved, and a moment's thought convinced it that the shape of a free surface of water must everywhere be the same. The class is now following the voyage of Columbus.

On the field excursion to Glencoe, several ravines were seen in various states of development, from a V-shaped gully with sides of clay still sliding downward, to a ravine with level bed six or eight feet wide at the bottom, with a forest growing on its sides and well-developed side ravines. To understand how the one developed into the other the class filled one side of a box with clay, leaving the other half empty, so that the clay formed a bluff in the middle of the box. About an inch of sand was put on top of the clay and water was flowed over the top. The following observations were made and recorded by the class: (1) Water first soaked into the sand, doing no wearing away. (2) When sand was saturated a narrow stream was formed on top which cut a narrow channel down to the clay. (3) When the stream reached the clay it made the channel in the sand wider instead of cutting down into the clay. (4) An alluvial fan was deposited at the bottom of the bluff. The experiment was afterward repeated on a bluff made entirely of sand. The above phenomena, with the exception of (3), occurred, and much more rapidly, and in addition the class noticed that the stream formed near the edge of the bluff and cut back toward the source. These facts made the formation of ravines much plainer, and it is hoped that another visit to Glencoe or some other ravine area will make the main features of the life-history of a ravine perfectly clear.

Nature study.—The work during October was mainly seasonal—the distribution of seeds, autumn colors, etc. The field trips to Glencoe and to the farm showed the importance of an acquaintance with the common stones, granite, sandstone, limestone, shale, etc., and the class has learned to recognize each and to pick out the various constituents of granite.

The class has made preparations for the planting of the seeds for the window gardens by writing out what the needs of plants are, and, in so far as

it was able, what the function of water, air, light, etc., was in the life of the plant. These papers will be kept and compared with papers upon the same subjects written later by the pupils.

Number.—The very first lessons developed the fact that the class was weak in the multiplication table and in the simple operations with fractions. Daily drill upon the former has been given, and considerable time spent upon the addition of both common and decimal fractions.

The trip to the farm showed that the class's idea of an acre was exceedingly vague. A portion of the school-yard was measured, its area in square feet found, and subsequently reduced to square rods and a fractional part of an acre. The finding of the number of square feet in a square rod, involving the multiplication of $16\frac{1}{2}$ by $16\frac{1}{2}$, was a difficult problem for the class. It was solved by laying out the square rod on the floor, dividing it into four parts corresponding to the four partial products, and determining, by counting when necessary, the number of square feet in each one.

The above problem involves all the processes in the multiplication of fractions, and similar problems will be given until the children become familiar with this process.

Oral reading.—The class read orally from Guerber's *Story of the Thirteen Colonies*, and studied and learned from selections Kipling's *Ballad of the East and West*.

Writing.—The class wrote records of the field trips to Glencoe and the farm, of the experiments upon erosion of sand and clay and sand alone, and upon the needs of plants. These were corrected for spelling, punctuation, arrangement, and grammar, and were then rewritten.

OUTLINE FOR NOVEMBER AND DECEMBER.

HARRIET T. B. ATWOOD AND WILLARD STREETER BASS.

History.—Early history of New England. The topics considered will be:

I. The Pilgrims in Plymouth harbor. Picture of men, ship, and surroundings. Search for a place to build the town. Story of the suffering of the first winter, the labor and good crops of the summer, and the first Thanksgiving day.

II. Why did the Pilgrims leave their homes in England to undergo such hardships? Story of persecution of Separatists and Puritans, and the driving of the Scrooby congregation to Holland. The further persecutions, the great Puritan exodus, and the settlement of Massachusetts.

III. Dispersive forces. The fact that each congregation desired to determine its own method of worship not only led to their leaving England, but even made them intolerant of control by their brethren in America. Hence we see Massachusetts settled in towns more or less widely scattered, and then the more individual and original spirits again pushing off by themselves and founding entirely new colonies—Connecticut, New Haven, and

Rhode Island. The principle of local self-government in America arose here.

IV. The New England Confederacy. The necessity for defense against the Indians and the Dutch and French settlers made some form of union among the colonies imperative, and in the New England Confederacy which resulted from this we may see the first fruits of the principle of union that resulted in the Confederation of the Colonies and the United States.

V. A typical New England town. Home life of the people: houses; furniture; cooking utensils; clothing—how made, cut, material, etc. Farms: fertility, products, stock, how cultivated. Public life: town meetings; church; school.

VI. Relations with the Indians. Treaty with Massasoit; Pequot war; King Philip's war.

REFERENCES (see also October number of this volume): Howe, *The Puritan Republic*, pp. 130 ff., 153 ff.; Bradford, *History of Plymouth Plantation*, pp. 97-129 (Massachusetts state edition); Fiske, *Beginnings of New England*; Doyle, *English Colonies in America*; Lodge, *English Colonies in America*.

For maps: Winsor, *Narrative and Critical History of America*, Vol. III, p. 272; Eggleston, *The Beginners of a Nation*, pp. 275, 296, 343; Drake, *The Making of New England*, pp. 77, 81, 156, 161.

CHILDREN'S REFERENCES: Moore, *Pilgrims and Puritans*; Drake, *On Plymouth Rock*; Austin, *Standish of Standish and Betty Alden*; Andrews, *Ten Boys*; Guerber, *Story of the Thirteen Colonies*; Blaisdell, *Story of American History*.

Literature, oral reading, and dramatic art.—Reading of *Courtship of Miles Standish*; dramatization of the Puritan Thanksgiving; Christmas songs and poems; interpretation of Dickens's "Christmas Carol;" the Bible story of the birth of Christ; study of Christmas customs in the colonies.

REFERENCES: The Bible; Dickens, *Christmas Carol*; Strutt, *Sports and Pastimes of the People of England*; "St. Nicholas Day in Holland," *St. Nicholas*, Vol. XXIV, pp. 233-5.

Geography.—I. Geography of New England: The Piedmont region and the New England plateau studied by means of pictures, descriptions, and stereopticon views. Topography, rivers, harbors. Character of soil. Climate. Natural products. Manufacturing advantages.

II. North America: General topography. Climatic belts. Distribution of industries. (1) The wool industry: study of sheep; sheep-raising on small farms and on western ranches; regions of North America where sheep are raised; location of woolen manufactures of North America. (2) Wheat production in North America: wheat culture; regions of North America suitable for raising wheat; wheat market of the United States.

Field trips proposed: Stony Island; Stock Yards; McCormick Reaper Works; flour mill; bakery; Field Columbian Museum; Washington Park hothouse.

REFERENCES: Powell, *Physiographic Regions of United States*; Reports of Department of State, Washington, D. C., *Commercial Relations of United States*

and *Review of World's Commerce*; Shaler, *Nature and Man in America* and *Story of Our Continent*; Mills, *International Geography*; Russell, *Rivers of North America* and *Lakes of North America*.

CHILDREN'S REFERENCES: Carpenter's Geographical Readers: *North America*; Frye, *Complete Geography*; Tarr and McMurry, *North America*; Adams, *A Commercial Geography*; Chase and Clow, *Stories of Industry*.

Nature study.—(In School of Education): (1) Practical window gardening; raising of tulips and hyacinths for Christmas and Easter gifts; brief study of hothouse gardening; experiments in plant physiology to answer questions raised by the children; observation of winter condition of trees and shrubs. (2) Study of animal coverings; observation of animal life in schoolroom aquaria and animal cages. (3) Study of outdoor landscape; frequent painting from windows; records of rainfall, temperature, and slant of sun's noon rays. (In Francis W. Parker School): Weather records: Individual records kept by the pupils in the form of Jackman's Nature Study Record. Large graphical records made for the school.

NOTE: Most of the work of keeping the records will be done by the children in the afternoon study periods or during intermissions, but once or twice a month a period will be taken for the discussion of the records, the causes of the changes observed, and their effect upon vegetable and animal life.

Pressure of air: Simple experiments to show weight and downward pressure of air; pumps; principle of the barometer.

Change of state of water: Experiments to make class more familiar with vapor transpired by leaves of plants, and with changes into snow and ice.

Botany: Window gardens. Plants will be raised chiefly from the seed; some, especially if designed for Christmas or Easter gifts, may be raised from bulbs. Observation of germination in seeds of bean, pea, squash, and corn, as well as flower seeds. Simple experiments on function of water in a plant, *e. g.*, (1) transpiration from leaves; (2) water path through a plant; (3) entry of water into plant rootlets and root hairs; (4) force which raises water from roots to leaves; (5) effect of lack of water (wilting). Observation of condition of outdoor plants.

Animal life: Observation of animals in school aquaria and vivaria. Reports on habits of outdoor animals, especially birds.

REFERENCES: Atkinson, *First Studies of Plant Life*; Barnes, *Plant Life*, pp. 391-400; Andrews, "Experiments in Plant Physiology," *Elementary School Record*, No. 4, p. 101; Comstock, *Insect Life*; Jordan, *Animal Life*; Coulter, *Plant Relations*.

Number.—Problems which arise in the work in nature study will be carefully solved. These will include problems in common and decimal fractions, denominate numbers, and in stating a ratio in the form of a per cent. For method of the work see November number of this volume.

Home economics.—Watching of vinegar made in October; brief study of fermentation. Canning of fruit; use of sugar in preserving. Making of a simple dessert with fruit; use of tropical fruits on the table. Preparing

pumpkin for Thanksgiving pies to be made by sixth grade; making of cranberry sauce. Making of Christmas-candies.

REFERENCES: *Mrs. Lincoln's Cook Book*; Church, *Food*; United States Department of Agriculture, *Year Book*, 1898, pp. 566, 567.

French.—(See outline for third grade.)

Music.—"Harvest Hymn," *Songs of Life and Nature*; "We Plow the Fields," *Songs for Little Children*, No. 2; "Duke Street," *School Hymnary*, p. 155; Reinecke, "Ye Shepherds Arise;" "French Christmas Song," "God Rest You, Merry Gentlemen," COURSE OF STUDY, Vol. I, No. 4; "Christmas Carol," *Modern Music Series*, No. 1; "Old Christmas," "Christmas Bells," *ibid.*, No. 2.

Physical training.—Free gymnastics, regular practice order. Tactogymnastics: exercises arranged to accompany marching exercises, of definite rhythm, executed in place in alternate order; alternation of marching and running in connection with facings, for control of step; serpentine and maze running. Apparatus gymnastics (see physical training outline): use of chest-bars, development of arms and shoulder-girdle. Hopping and skipping; high and broad jumps; improvement of form.

Indoor games: first in, first out; touch-ball; foot in the ring. Outdoor play and practice: cross-tag; practice of starts and runs over short distances, timing over definite distances, not in excess of fifty yards.

Physical measurements, tests: jumping and climbing records. Individual exercises (special). Home exercises.

SIXTH GRADE.

JENNIE E. CURTIS.

REVIEW FOR OCTOBER.

Geography.—During October we explored the basin of a small stream that had cut its way through several lots from which the sod had been removed. In this stream and its tributaries we found that falls are made by obstructions in bed of stream; that a change of direction of stream may be caused by obstructions, by soft material yielding to wear, or hard material resisting wear; that the angle at which a tributary enters the main stream depends on the forward or source slope of the land; that where a stream curves it wears on the concave side and builds on the convex side.

Each child made a drawing of the basin and read in the library on brooks and river basins.

The lakeshore at Glencoe was visited in order to study building and erosion by waves; wind-waves and water-waves on the sand; clay cliffs made by erosion; the difference in vegetation on clay or on sand. We explored a large ravine and several of its tributaries to notice the location and wearing of bowlders.